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Secretary

**Comments Regarding Universal Service CC: Docket No. 96-45**

**December 12, 1996**

**Mountaineer Doctor TeleVision- MDTV**
**State Wide Telemedicine System**
**Robert C. Byrd Health Sciences Center**
**of West Virginia University**
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Q: What level of bandwidth are you currently using?

A: Dedicated T-1, 1.544 mbps.

Q: What is the monthly rate for this service? (On Average)

A: $19,500 per month, $234,000 per year (15 sites x $1300 per mo. per site)

Q: What is the rate for this in the nearest urban area?

A: We have not been give firm pricing for urban areas. Mileage and LATA boundaries play a key role in dictating pricing for urban and rural markets. Taking the signal through additional phone offices effect the price as well.

Q: What monthly rate would you pay if you were to order the other listed level of service instead?

A: Our current service is available 24 hours a day, 7 days a week.
$ 25920 for 384 Kbps ISDN
$36.00 per hour 24 hours a day for 30 days.

Q: Would an infrastructure upgrade be required to provide you with any of these service levels? What would it cost?

A: Many areas of West Virginia do not have access to ISDN. Digital switching is not available to many of the smaller private phone companies serving rural areas of the state which need the telemedicine services the most. We do not have access to pricing on what it would cost to outfit a phone company with digital switching. With our current T-1 service we are charged an installation fee of over $1,600.00 to establish T-1 service.

Q: If any level of bandwidth were available to you at the rate charged for the same service in the nearest urban area, which level would you choose?

A: ATM technology. 155 Mbps

Q: If local access to the Internet is not available, what is your monthly expenditure to reach an Internet Service Provider (ISP)?

A: For 28.8 dial up access from an area where a long distance call is required, the charges range from .07 per minute to .28 per minute. This does not include the monthly service fee that averages $20.00 per month.

Q: Are you charged for traffic between Local Access and Transport Areas (LATAs) at rate above those paid by customers in the nearest urban area of your state?

A: Mountaineer Doctor TeleVision is a state-wide telemedicine program. We are charged for crossing LATA boundaries with our signal.

Q: What is the relative value, in terms of quality of care, of access to ISDN, 384 Kbps and T-1 level service or the equivalent? Which levels of bandwidth are necessary for the provision of which types of health care services?

A: For the MDTV system anything less than T-1 (1.544 Mbps) that allows transmission of NTSC video has been unacceptable to our providers. Problems encountered during transmission of video via telephone lines is amplified at lower bandwidths when part of the service is allocated to non -video uses such as data, teleradiology and electronic stethoscope transmission. Our health care professionals firmly believe that anything less than the best picture that we can give them is unacceptable.

Q: How would you compare the use of telemedicine to other types of health care delivery? What are your reasons for using telemedicine in a given instance? Are there specific benefits of using telemedicine that should be identified for decision makers?

A: In the experience of our providers and patients at remote sites, the major benefit of telemedicine is the issue of access to specialty care. 35 of West Virginia's 55 counties are designated as medically underserved. In counties where medical service is available, it is often limited to the most basic of services. Patients in West Virginia travel many hours for visits with specialist for such seemingly common problems such as diabetes and arthritis. Travel to seek healthcare has created a tremendous hardship for patients and their families. The expense of travel has put a financial drain on their resources. In surveys that we have done, the access and convenience to healthcare has been the overwhelming attraction of telemedicine.

Q: How many rural health care providers eligible for universal service support are using telemedicine? Where are they located?

A: There are 15 locations in West Virginia's state-wide telemedicine system. (See map enclosed)

Q: How many rural health care providers eligible for universal support are not currently using telemedicine? Where are they located? What is the level of infrastructure build out available to them?

A: In West Virginia's 55 Counties there are over 75 locations providing medical services that may qualify for universal service support to provide bandwidth for a wide range of services.
Most of the T-1 service already in place is offered through existing copper phone line infrastructure. The small local exchange carriers (LEC's) use T-1 technology to provide basic phone service throughout their service areas. The overwhelming majority of the state is currently able to support T-1, 1.544 mbps service.

Q: Where and at what rate are Internet Service Providers (ISPs) expanding in rural areas of the country? Can you estimate the cost of providing toll- free access?

A: A large number of Internet Service Providers have expanded across the state of West Virginia. Telephone, Cable and Newspaper companies are providing service to many of these rural areas. These groups are able to afford the cost of the bandwidth to support a larger number of users. Many of the independent providers provide SLIP-PPP access via ISDN technology. Toll free access remains a road block for many of the providers to reach the most rural areas of the state.

Q: Do Insular areas experience a disparity telecommunications rates between urban and rural areas? (Please supply demographic information including the size of cities in these areas.)

A: Charges increase by taking the signal through various offices to rural areas. Below is an example of two T-1, 1.544 Mbps circuits, taking the circuit 13 additional miles to the rural location, through an additional telephone office increased the cost by over 100 percent. (Note the local channel charges associated with going through additional offices).

## T-1 Service 1.544 Mbps
## Urban Area

| | |
|---|---|
| Huntington WV (pop. 54,844)<br>to<br>Charleston WV (pop. 70,932) | 43 miles |
| 1 Inter-office channel<br>47 miles included in channel charge | $475.20 |
| **Total Cost for circuit** | **$475.20 per month** |

## Rural Area

| | |
|---|---|
| Madison WV (pop. 3,051)<br>to<br>Charleston WV (pop. 70,932) | 56 miles |
| Local channel #1<br>Local channel #2<br>23 miles included in channel charge | $500.00<br>$501.55 |
| **Total cost for circuit** | **$1001.55 per month** |

Q: Are technological changes expected to increase or decrease the demand for bandwidth for telemedicine? How quickly are such technological changes expected to occur? Are they likely to affect particular medical specialties more than others?

A: Technological changes are having an effect on telemedicine. In response to the high telecommunications costs associated with telemedicine systems many lower bandwidth solutions have appeared in the past few years. Store and forward technologies which use Plain Old Telephone Service (POTS) are popular solutions for many users. Compression schemes have enabled video applications to be used with less bandwidth. The quality of these changing technologies is the center of much debate. It appears that the current trend is to increase bandwidth. Vendors are now marketing a larger number of products that do not support speeds at or below 1.544 mbps. DS3 and Asynchronous Transfer Mode (ATM) with bandwidth speeds in the 45 and 155 Mbps respectively, are now popular solutions for video and data applications. Telecommunications carriers proclaim that "bandwidth is not a problem". Although many carriers have capacity to offer expanded services, the cost associated with these services forces many users to sacrifice quality and select solutions that are not ideal for the application. Teleradiology services have been using a large number of ISDN lines to provide service to many areas. While it may be popular for many data applications ISDN for full motion video applications may prove to be out of many users price range. (See example below)

**Example of Using 384 Kbps (marginal quality for medical application)**

**Hub Site location**

| | |
|---|---|
| 1 ISDN BRI Circuit- 128 Kbps (2 channels) | $20.00 |
| 1 ISDN BRI Circuit- 128 Kbps (2 channels) | $20.00 |
| 1 ISDN BRI Circuit- 128 Kbps (2 channels) | $20.00 |
| 384 Kbps (6 channels) | $60.00 per month |

**Remote Site Location**

| | |
|---|---|
| 1 ISDN BRI Circuit- 128 Kbps (2 channels) | $20.00 |
| 1 ISDN BRI Circuit- 128 Kbps (2 channels) | $20.00 |
| 1 ISDN BRI Circuit- 128 Kbps (2 channels) | $20.00 |
| 384 Kbps (6 channels) | $60.00 per month |

.10 per minute per channel x 6=
.60 per minute @ 384 Kbps x 60 min. (1 hour)= $36.00 per hr.

| | |
|---|---|
| $36.00 per hour x 25 hours = | $900.00 |
| **Total for two sites using system less than 1 hour per day** | **$1020.00 per month** |

While medical services are the key component of telemedicine systems, educational usage for patients, health professionals and students have increased the usage of this technology. Shared bandwidth uses with radiology, pathology and computer networks increase the need for bandwidth. Multiple uses of telemedicine networks and the need for high quality full motion video make the case for T-1 bandwidth. The most cost effective and most reliable of the T-1 services has been offered through dedicated T-1 circuits.

Dial up service for speeds up to 1.544 Mbps. is currently available, but not to a wide range of users. The current pricing for this service is cost prohibitive for many users. The current pricing in West Virginia for ISDN Primary Rate Interface (PRI) service is in the range of $1200.00 per month. This is for service only, charges are based on a per minute/per channel basis above the service amount. This current pricing prohibits a bandwidth on demand service from being cost effective.

Q: To what extent, and on what schedule, might ongoing network modernization, such as that occurring under private or state-sponsored initiatives, make universal service network upgrades unnecessary?

A: The current trend is to implement Asynchronus Transfer Mode (ATM) technology. While many of the carriers suggest this technology, and the benefits it provides none of the carriers have been able to offer it cost effectively for non-profit health care and educational usage. Most of the carriers are working to partner with large organizations who can support the large initial cost to implement the technology, namely ATM switches.